

AMENDMENTS TO CLAIMS

The following listing of the claims replaces all prior claim versions and listings.

Claim 1. (Currently Amended) An array antenna receiver device comprising:

- a plurality of antenna elements;
- a means for outputting calibration signals;
- a means for distributing the calibration signals to the plurality of the antenna elements;
- a plurality of multiplexing means each of which multiplexes each calibration signal distributed with a signal input from each of the plurality of the antenna elements;
- a plurality of SIR calculating means each of which extracts and demodulates each calibration signal from an output signal of the multiplexing means to calculate a SIR (Signal to Interference Ratio) value, and further compares the SIR value calculated with a previously established SIR threshold value thereby to output reception branch information and a demodulation result of the calibration signal ~~in only the case when~~ the SIR value calculated exceeds the SIR threshold value;
- a means for storing a reference demodulation result which is previously established in each reception branch;
- a means for detecting a calibration amount of amplitude/phase information in each reception branch based on the demodulation result and the reference demodulation result in a branch corresponding to the storing means; and
- means for correcting a user signal based on the calibration amount.

Claim 2. (Original) The array antenna receiver device as defined in claim 1 wherein an electric

power of the calibration signal is a fixed electric power sufficiently smaller than a noise electric power in a receiver of a radio base station installation.

Claim 3. (Currently Amended) The array antenna receiver device as defined in claim 1 wherein a calibration period for updating a calibration amount in each reception branch differs from one another in every reception branches or in each period of time even in the same reception branch.

Claim 4. (Original) The array antenna receiver device as defined in claim 1 wherein the calibration amount calculating means calculates a calibration amount with respect to only a reception branch to which a demodulation result of a calibration signal is input.

Claim 5. (Currently Amended) The array antenna receiver device as defined in claim 1 wherein when the SIR value does not reach a SIR threshold value, a user signal in a reception branch in question is made to be ineffective as a result of judging that a ~~trouble~~ problem appears in the reception branch in question.

Claim 6. (Original) An array antenna receiver device comprising

- a plurality of antenna elements;
- a means for outputting calibration signals;
- a plurality of multiplexing means for multiplexing each output signal from the plurality of the antenna elements with each calibration signal;
- a means for changing over connections of the output means with the plurality of the multiplexing means to supply calibration signals in a time sharing manner to the plurality of the

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multiplexing means;

a plurality of SIR calculating means for extracting and demodulating successively calibration signals from output signals of one multiplexing means selected respectively in synchronous with supplying operations of the calibration signals from the supplying means in accordance with the time sharing manner to calculate a SIR (Signal to Interference Ratio) value, and further compares the SIR value calculated with a previously established SIR threshold value thereby to output reception branch information and a demodulation result of each calibration signal in only the case when the SIR value calculated exceeds the SIR threshold value;

a means for storing a reference demodulation result which is previously established in each reception branch;

a means for detecting a calibration amount of amplitude/phase information in each reception branch based on the demodulation result and the reference demodulation result in a branch corresponding to the storing means; and

means for correcting a user signal based on the calibration amount.

Claim 7. (Original) The array antenna receiver device as defined in claim 6 comprising further a means for controlling a transmission electric power of a calibration signal based on a control signal in response to a SIR value of the SIR calculating means.

Claim 8. (Original) The array antenna receiver device as defined in claim 6 wherein the supplying means changes over connections with the multiplexing means based on reception branch information from the SIR calculating means.

Claim 9. (Original) The array antenna receiver device as defined in claim 6 wherein an electric power of the calibration signal is a fixed electric power sufficiently smaller than a noise electric power in a receiver of a radio base station installation.

Claim 10. (Currently Amended) The array antenna receiver device as defined in claim 6 wherein

when the SIR value does not reach a SIR threshold value, a user signal in a reception branch in question is made to be ineffective as a result of judging that a ~~trouble~~ problem appears in the reception branch in question.

Claim 11. (Previously Presented) The array antenna receiver device as defined in claim 1 wherein a BER (Bit Error Rate) is used in place of the SIR value.

Claim 12. (Currently Amended) A calibration method of antenna reception signals comprising the steps of:

multiplexing a reception signal input in every plural antenna elements with a calibration signal distributed in the every plural antenna elements;

extracting and demodulating a calibration signal from the multiplexed signal to calculate a SIR (Signal to Interference Ratio) value of the calibration signal;

comparing the SIR value calculated with a previously established SIR threshold value to output reception branch information and a demodulation result of the calibration signal in only the case when the calculated SIR value exceeds the SIR threshold value;

detecting a calibration amount of amplitude/phase information in every reception

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branches based on the demodulation result and the previously established reference demodulation result; and

correcting a user signal based on the calibration amount.

Claim 13. (Currently Amended) A calibration method of antenna reception signals comprising the steps of:

multiplexing a reception signal input in every plural antenna elements with each calibration signal supplied in a time sharing manner in the every plural antenna elements;

extracting and demodulating successively calibration signals ~~from~~ from one multiplexing signal selected respectively in synchronous with supplying operations of the calibration signals in accordance with the time sharing manner to calculate a SIR (Signal to Interference Ratio) value of each calibration signal;

comparing the SIR value calculated with a previously established SIR threshold value to output reception branch information and a demodulation result of the calibration signal ~~in only the case when~~ the calculated SIR value exceeds the SIR threshold value;

detecting a calibration amount of amplitude/phase information in every reception branches based on the demodulation result and the previously established reference demodulation result; and

correcting a user signal based on the calibration amount.

Claim 14. (Previously Presented) The array antenna receiver device as defined in claim 6 wherein a BER (Bit Error Rate) is used in place of the SIR value.

Claim 15. (New) The array antenna receiver device as defined in claim 1, wherein a trouble detection signal is output when the SIR value calculated does not exceed the SIR threshold value.

Claim 16. (New) The array antenna receiver device as defined in claim 1, wherein each of the plurality of calculating means calculates the SIR value for a period of calibration until the SIR value calculated exceeds the SIR threshold value.